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Abstract

The Bologna Declaration is an impetus for the implementation of enterprise systems at Higher Education Institutions (HEI) – so-called Campus Management Systems (CMS). The implementation of such enterprise systems leads to a change of organizational structures. This is a challenge especially for HEIs. As the communication and the flow of information are essential in such projects, we explore aspects that have a negative impact on the information flow. Considering the specific organizational structure of HEIs, it is important (1) to understand the specific, decentralized organizational structure and (2) to assign tasks and roles to adequate employees that are ‘professionals’ or that are supported by ‘professionals’. We conducted an exploratorycase study at a large university with more than 40,000 students.

1 Introduction

By now 47 countries throughout Europe adopt the Bologna Declaration, introducing comparable degrees based on a three cycle structure - bachelor, master, doctorate [2]. The Bologna reformation has an impact even beyond the borders of Europe [32].It entails an increasing amount of administrative work [1, 4] and therefore is a main driver for Higher Education Institutions (HEIs) to introduce Campus Management Systems (CMS) [1, 25].

A CMS is an integrated application system that supports all study related processes. This includes the operational tasks regarding the entire student life cycle and providing adequate information for the management of HEIs [1, 5, 22, 27].Regarding the definition of Enterprise Resource Planning (ERP) Systems, CMS are comparable [1]. ERP Systems are integrated software systems, as well, aiming to support core business processes and integrate data in organizations [6].Much research exists on ERP Systems.However, as the failure rate of ERP implementation is still high, a current study provides a holistic analysis of success and risk factors of such implementation projects [12]. These success factors may also be helpful regarding

implementation project of CMSs, as in both cases the implementation, the standardization, and integration of processes leads to a change of organizational structures [1, 14]. However, the integration of CMS entails a specific project context, as the implementation takes place at HEIs.HEIs are highly resistant to change [7, 23, 29] and may be in need for different information system development strategies [11, 17].Following the typology of Mintzberg [21], HEIs can be classified as professional bureaucracies [13, 20]. In this context, the academic personal are highly trained professionals forming adecentralized, autonomic operative basis that holds much power.The question arises if and to what extent the risk and success factors for ERP implementations are valid for CMS implementations.

Compared to research on ERP projects, the research on CMS is rather new. However, current research on software implementation at HEIs considers communication an important factor [4, 9,14, 15]. Further,communication can be seen as part of change management [26], which is another important factor in such projects [12].Hence, we consider communication and the flow of information as essential in such projects.

We examine the implementation of a CMS at the University of Cologne (UoC), Germany, with more than 40.000 enrolled students.Current case studies on the implementation of integrated information systems at HEIs do not explicitly consider the HEIs' organizational structure [5, 14] or theproject structure [5, 9, 14 15].Due to the high autonomy within the decentralized organizational structure, we consider the project structure as essential to achieve the successful implementation of an integrated system. Therefore, our study provides a novel perspective on the implementation of CMS in a HEI, emphasizing the need for an explorative approach. We focus on the information flow between the overall project team (CMS Team) and the Faculty of Management, Economics and Social Science (FoMES). Based on specific decisions made by the faculty, we identify aspects that have a negative impact on the information flow. The case study aims at a detailed description of these relevant aspects in the underlying context. This adds to the body of knowledge in terms of research on CMS projects regarding the aspects that have to be considered when conducting implementation projects at HEIs and how to cope with them.

In the next section, we present our applied methodology. Section 3 provides an overview of the implementation project, regarding its project structure and the course of the project. The findings – the aspects having a negative impact on the information flow – are presented in section 4. The aspects and possible solution are discussed in section 5 with regard to the organizational characteristics of HEIs. Finally, section 6 concludes this article.

2 Methodology

In this section, first we present the suitability of the case study approach for our purpose. Then we describe the data collection and analysis in more detail.

2.1 Case study

The goal of our study is to evaluate and understand practice – in this case the implementation project of a CMS –to gain new findings and apply them to improve this practice [10, 18]. We chose the case study as a methodology as it allows investigating contemporary phenomena within their context[31] and the application of more than one method for data collection [8, 31]. As we are interested in new findings in the context of the UoC, this study has anexploratory

character. However, as we expect to gain insight into the reasons responsible for our findings, we expect the study, as most case studies, to be exploratory and explanative [31].Adopting an interpretive approach, weare aware of our role a researchers [10, 30]. In this context, we are no independent observer, but a part of the context, that is, the social world we study.We present the data collection and analysis in more detail in the next sections.

2.2 Data collection

We conducted interviews and collected documents regarding the examined phenomenon to corroborate our findings [10, 30, 31].

The initial and unstructured Interview was scheduled with the IT Official of the FoMES who was a member of the CMS Board and the ICT Committee. In this interview, we obtained an overview of the course of the overall project. Additionally, about 150 documents including e-mails, training material, manuals and protocols from conferences were provided. We collected further documents from the official web pages of the university and the project. We conducted another unstructured interview with the overall project manager to complement the overview about the course of the overall project. Both initial interviews were based on a narrative approach [10]. To start and encourage the narration, we posed only open and general questions, covering: The role of the interview partner in the project, the course of the overall project and changes that occurred in the project structure.

Based on these initial interviews, we scheduled five semi-structured interviews with the above mentioned and three further participants. One of the new participants was head of the Examination Officeduring the overall project. The Examination Office coordinates the examinations, the necessary enrollment and the publishing of the grades. Initially, the examination management module of the CMS should replace the existing examination management system. One of the other two participants was and the other still is responsible for the operational organization and coordination of the project at the FoMES. The semi-structured interviews followed a guideline which was sent ahead to the participants for preparation to ensure that the same topics were covered by the different participants. However, the participants had the chance to address the questions in their preferred order and unfolding narrations were not intercepted. Before ending the interviews, the guideline was checked for questions that were not yet addressed. The interview guideline embodied open questions only, focusing on the implementation project at the FoMES. These questions covered: The role of the interview partner in the project, the course of the project, the project structure and changes that occurred in the project structure, the specific project entities, the communication within the project, the role of the E-Learning System and the IT-Governance.

2.3 Data analysis

We based the analysis of the data on qualitative content analysis [19]. This includes the coding of the data to find relevant aspects. The coding of data does not prevent the researchers from a subjective approach [30]. However, it allows linking our findings directly to our collected data and was helpful for restructuring our identified aspects throughout the research, which is important as the developed categories, that in the end constitute our aspects, are constantly adjusted throughout the study.

We identified the relevant aspects by coding the interview protocols and used the collected documents to verify person-specific data and place the interview statements into the project

context. Therefore, the documents were essential for explicating the interview material with respect to the project context [19].An aspect is considered as having a negative impact on the decision-making process if information is missing that is relevant for the decision. A decision consists of the problem, the need for and the purpose of the decision. To determine the best of the given or existing alternative actions, these are prioritized considering criteria and stakeholders affected by the decision [24]. Of course, it cannot and should not be determined if the best alternative - if existent at all - was chosen. Retrospectively, through the information provided by the interview partners, it can only be determined if information which was identified as relevant was missing regarding specific decisions.

We chose the elements and the consequences of the decisions as predefined concepts for the data coding.Using an analysis tool (NVivo) allowed comparing the codes regarding the decisions and their components. This approach makes it possible to compare the view of the different interview partners regarding each decision - e.g., available information for a decision maker, different point of views. This allows the identification of problems regarding the information flow, even when not explicitly mentioned by the participants.

The sentences and statements are also coded into emergent concepts, regarding the aspects impacting the information flow. After the coding of all protocols, each identified concept was checked for coherence. All included code had to match the description of the concept. Otherwise we adjusted or rejected the concept. We checked the concepts whether they were corroborated through more than one participant and merged redundant concepts. If the concepts were disjunctive, we checked whether relations or dependencies exist between these concepts. From the resulting concepts, we identified the ones which had a negative impact on the decision-making, in the following referred to as relevant aspects.

3 Case Description

In this section, we provide an overview of the case, focusing on the project structure. We first present the project structure and how it is embedded into the UoC. Then we provide a short overview, how the project structure evolved during the course of the project.

3.1 The UoC and the FoMES: Building the project structure

The UoC is, with respect to the number of students, the third largest university in Germany [28]. More than 40,000 students are enrolled at the six faculties. The FoMES is with over 8,000 students and more than 700 course modules the second largest faculty at the UoC, after the Faculty of Arts and Humanities (FAH).

Figure 1shows the simplified project structure from the project's beginning in October 2006 and its evolvement during the project. The *CMS Board* forms the central platform for the communication and strategic coordination across the project participants. It consists of the

- *CMS Team*, consisting of six members, including the *Overall Project Manager*,
- the *Rectorate*, especially the responsible office of the Pro-Rector of Teaching and Studies,
- representatives of each *faculty* involved,
- and further representatives (e.g., the Data Protection Official, Department of Student Affairs, the Regional Computing Center).

At each faculty a *CMS Task Force* was established with the beginning of the implementation. In this task force, the requirements of the faculty were discussed and the CMS Team informed the faculty representatives about the projects' progress. The representatives were responsible to forward the information to the faculty members. At the FoMES, the *IT Official* was part of the taskforce as well. He advocated the IT requirements of the FoMESin front of central institutions and coordinated university-wide projects and those internal to faculties.

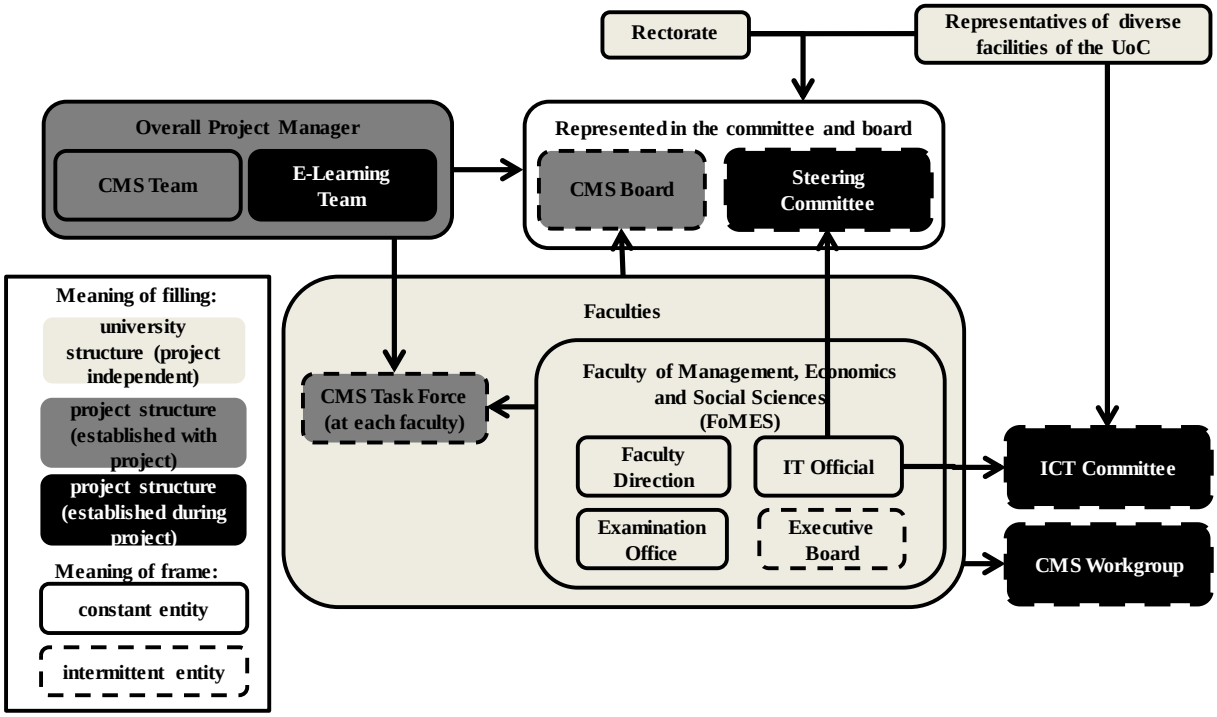

Figure 1: Embedded project structure and its evolvement during the project

The *Steering Committee* was composed like the CMS Board, except for a number of representatives, e.g., of the faculties. The IT Official of the FoMES was part of it, but in this case not as a representative of the faculty. The Steering Committee counseled the Rectorate in project decisions based on the suggestions and recommendations of the CMS Board.

The *ICT Committee* integrates the universities libraries and the center for applied informatics. During the course of the project this committee evolved, getting a more and more strategic focus with tasks regarding the coordination of IT services and architecture across the universities' facilities, reaching beyond the CMS project. The Committee and its organization are still evolving. The creation of two working committees, which should support the ICT Committee in its decision – regarding the universities' service portfolio and comprehensive IT strategy – is currently under discussion.

After the strategic part of the project was considered completed, the CMS Board ceased its meetings. Instead, the *CMS Workgroup* was established where employees from the faculties met to exchange experiences and to discuss requirements and the configuration of the CMS on an operational level. Before the establishment of this Workgroup, only meetings took place between the faculties to evaluate the enrollment phases. Further, communication between the faculties took place bilaterally.

3.2 Course of the Implementation Project

We provide a short overview of the implementation project's course in Table 1.The changes in the project structure are emphasized. The presented course is focused on the events around the FoMES from the decision to adopt the bachelor and master degrees to the most critical implementation phase; before a central dedicated coordination of the project at the FoMES was established. Now, the course management, including enrollment in courses and the interface of the CMS to the E-Learning platform is implemented. However, the examination management of the FoMES is still running on the legacy system.

Date	Scope	Event	Impact / Comment
May 2006	UoC	Decision to implement a CMS	First software implementation project of this size and complexity at the UoC
From June 2006	UoC	Overall project manager developing overall project structure	
October 2006	UoC	Start of implementation project	
December 2006	FoMES	Decision to extend existing system of the FoMES instead of CMS for examination management of bachelor degrees. Considering implementation of the CMS' course management instead.	Uncertainty regarding the CMS and if the support of the heterogeneous processes at the different faculties was possible. Further, risk of a simultaneous implementation at the FAH and FoMES should be decreased.
April 2007	UoC	*Establishment of the Steering Committee*	
	Faculty department	Pilot project at department, where self-contained degree programs exist	
October 2007	UoC	Introduction of bachelor degrees	Introduction of the master degrees postponed
	FAH	Start of implementation project	
December 2007	FoMES	Implementation of examination management for masters degree postponed. Instead implementation of course management for all degree programs, and pilot project to connect E-Learning with CMS	The E-Learning system already existed and was used by different faculties, especially by the FoMES, where this system was developed.
January/February 2008	UoC	*Establishment of ICT Committee*	
June 2008	UoC, FoMES	*E-Learning Team established*	
December 2008	FoMES	First attempt to map the examination regulations of the FoMES by the CMS Team	It became obvious that the mapping differed from the requirements.
January and March 2009	FoMES	New employees hired for operational organization and coordination of the project at the FoMES	Since then, the course management at the FoMES was gradually extended.
Middle of 2009 - August 2011	UoC	*CMS Board ceased its meetings. CMS Workgroup was established*	Strategic part of project was considered completed.

Table 1: Course of the implementation project

4 Findings

This sectionpresents the identified aspects having a negative impact on the information flow. The (1) vague definition of roles, (2) improper decision makers, (3) informal communication, (4) transfer of inherent experiences and knowledge, and (5) lack of documentation.

4.1 Vague definition of roles

Some roles were not clearly defined, e.g., regarding their purpose, rights and duties, regardless of a role being assigned to a person or project entity. Before an employee was hired for the operational organization and coordination of the project at the FoMES in January 2009, the CMS Team had no distinct and clearly defined contact persons. Communication between CMS Team and faculty for central decision making was not possible up to this moment. Another example for the vague definition of the role of a project entity is the E-Learning Team. It developed a possibility for the connection of the E-Learning System to the CMS which led to an adjustment of the E-Learning course structure that was used by the FoMES. Furthermore, a developer who was not legally obligated for the further maintenance and support of the system was hired for the development of the interface. These decisions were not communicated to and coordinated with the FoMES. Hence, the faculty was not aware of these decisions and their consequences, and would not have agreed to the pilot project under these circumstances. In the opinion of the IT Official of the faculty, the E-Learning Team misunderstood its role regarding their right to make these decisions. However, the role of the E-Learning Team and their associated rights could not be clearly resolved. Another problem was that the members and tasks of the committees were not clearly defined. This led to ineffective meetings in which necessary decision makers were absent and topics were discussed which were not adequate for this meeting.

4.2 Improper decision makers

As pointed out before, it is necessary to have all relevant information for decision making, or rather for being able to make the best possible decision. Therefore, a decision maker is considered as improper if he does not have the possibility to gather all relevant information due to his role or position in the project. It is important to understand that this is neither a statement about the qualification of the decision maker, nor that there is a more proper decision maker available. An example is the above mentioned hiring of an employee for the operational organization and coordination of the project at the FoMES. She immediately was set as the central contact person for the CMS Team and the faculty. The employee herself stated that she had no skills regarding the CMS. Hence, she was not able to assess the requirements of the departments that were communicated to the CMS Team. Further, she had no possibility to gather the necessary information, e.g., by means of dedicated contact partners. This led to conflicting and dispensable requirements. Another example is that the IT Official held many meetings with the CMS Team to discuss and coordinate the implementation, although many organizational topics still had to be discussed, e.g., regarding the reformation of teaching and studies, for which the Dean or Vice-Dean are responsible. In this context, the project was seen as an IT-project, that is, an implementation of a system that would lead to an alignment of the processes across faculties. Therefore, employees responsible for organizational tasks and processes did not participate or were not involved in the project in an appropriate extent.

4.3 Informal communication

Communication channels existed which were not defined by the project structure. This informal communication can take place between individual persons, but even within a committee which is not formally convened. In thiscase, the Steering Committee was summoned by the Rectorate, independent of the formally established structure. However, as the committee was summoned officially and became a part of the project structure, the committee and its communication might be informal, but also official and transparent. Hence, the CMS Team was able to react (e.g., by taking part in the meetings, accessing meeting protocols). More problematic might be the informal communication, ranging from rumors to distinct exchange of information on a regular basis. Besides some examples where information was obtained informally to prepare for meetings, there is an example for the distinct exchange of information which shows the possible issues: The heads of the Examination Offices in the FoMESand the FAH were in contact. As the implementation started at the FAH, information about the course of the project and especially about occurring problems was exchanged. This information was disseminated at the FoMES and considered in its decisions. Taking into account the differences between the faculties (e.g., the different legacy systems, different organization of the exam and course management, the more centralized organizational structure of the FoMES) it can be questioned whether the obtained information can be transferred from the FAH to the FoMES. Because of the different contexts of the faculties, the transfer of the information without the necessary adjustments (e.g., a review by the CMS Team) leads to a suboptimal information basis.

4.4 Transfer of inherent experiences and knowledge

Experiences that were made in the course of the project and the resulting knowledge were transferred to different contexts without adjustment. Inherent assumptions were not communicated between the CMS Team and the FoMES. The prominent example during the course of the project is the mapping of the degree programs into the CMS. At the FAH, the CMS Team mapped examination regulations on their own into the respective CMS module. This was a sufficient solution for the course structure at the FAH where new courses are defined every semester. In contrast, at the FoMES, the programs consist of regular courses and the examination regulations are more rigid. Despite these differences, the CMS Team wanted to map the examination regulations the same way as they did at the FAH. The FoMES in turn build its expectations based on its understanding of the examination regulations. Further, it had only the information from the CMS Team that the examination regulations should be mapped into the CMS module, but not on how this would be done.

4.5 Lack of documentation

The lack of documentation is mentioned in different contexts. One example is amissing documentation of the mapping process of the regulations. Therefore, the faculties followed different approaches and were not able to refer to already realized mapping structures. Furthermore, there was no formal documentation which was permanently updated and which determined the project structure. We assume that the lack of documentation also leads to missing, false or ambiguous information. Insufficient documentation renders it impossible to disseminate the same pieces of information to a varying amount of different recipients over a long time period and therefore leads to the loss or misinterpretation of information.

5 Discussion

In this section, we present the identified aspects referring them to the specific organizational structure of HEIs. Then, we discuss the project structure and its evolvement throughout the project's course. Finally, we provide limitations of our study and possible for further research.

5.1 Relevant aspects and the university as a professional bureaucracy

In this section, we link three of the identified aspects to reasons thatcan be related to the organizational structure of the university as professional bureaucracy. Further, we present case-related solutions, that is, solutions that were observed from the case study or which are derived directly from observed issues (Table 2). The latter ones are enclosed in parentheses.

Relevant aspects	Reasons for negative aspect due to organizational structure at the UoC	Case-related solution
Vague definition of roles	Organizational structure was not clearly defined; not documented entities existed. No clearly defined contact persons providing communication interfaces between stakeholder groups existed.	(Clearly state what purpose, tasks, rights, duties and, - where necessary - members are assigned to a role and define central coordinators.) (Clearly define requirements of a role.) Involve professors, who are an important and autonomic part of the university structure, early and seek their commitment. For operational decision making, employees with the necessary know-how are needed, supported by professors.
Improper decision makers	Decisions are made by professors who lack the knowledge of the processes, that is, they do not have all relevant information. It is problematic for employees to advance their own views if they do not hold a professorship.	
Informal communication	Decentralized and autonomic structure leads to instransparent communication channels. Decentralized power centres lead to instransparent project structures.	(Gather information about possible informal communication channels and involve active communicators.) Provide information (e.g., through support, contact persons) to foreclose informal communication as far as possible, e.g., by establishing an open exchange platform.

Table 2: Reasons and solutions for negative aspects

The vague definition of roles and the improper decision makers are closely intertwined. Considering the proposed solutions, we see the main problem in defining decision makers that are accepted by professionals [21]. Even if an employee has the required know-how, he may not be accepted as a professional and may need an accepted professional to support his suggestions.Considering the informal communication, we see the main challenge in understanding the internal structure of an HEI. We argue that a project team should focus on understanding the existing structure and identify professionals that can support the project.

5.2 Centralization within the project structure

The implementation of the CMS entailed a centralization of organizational and technical aspects. The development of the project structure clearly shows that the necessity of university-wide coordination of these aspects was realized in the project'scourse. Organizationally, this is visible in the establishment of the CMS Workgroup as a platform for the communication between faculties onan operational level. This platform was on the one hand utilized for making agreements regarding the configuration of the CMS for global settings. On the other hand it was

utilized for discussions and the exchange of experiences with the CMS. Technically, this is visible in the establishment of the ICT Committee and the planned establishment of the supporting Working Committees. Besides project specific topics also other IT-topics and their coordination were and should be covered in these committees. This is part of an IT-Governance that is currently planned at the UoC. It is important to consider the existing and possibly parallel hierarchies or structures [3] when building the project structure at a HEI. The autonomy of the faculties and of single persons leads to a gap between documented and actual structures. From an external view, these structures can be very intransparent. As HEIs are decentralized and highly resistant to change, we argue it is the more important to initially centralize the organizational structure within the project.

5.3 Limitation and further research

The challenge of implementing integrated systems at HEIs is primarily an organizational one [9, 14, 15], emphasizing our results'importance.Due to the novelty of research on CMS implementation and our specific focus on the university and project structure, the generalization is limited.Existing research on implementation of integrated systems at HEIs considers important issues and challenges[5, 9, 14, 15]. Surprisingly, the importance to specifically address professionals within HEIs is not explicitly considered. We argue that addressing professionals to gain access to organizations' sites and employees with the necessary know-how is essential. Neglecting to address professionals in advance may even inhibit considering an implementation of a CMS due to the high autonomy within the decentralized structure [25].Further research should assess the importance of our results within other HEIs and aim for generalization. We see the necessity to compare structuresacross HEIs and, if available, their approaches on the implementation of CMS.Such a study would provide a basis to systematically compare HEIs with other professional bureaucracies from sectors with a broad body of knowledge regarding systems implementation.

The information dissemination, e.g., between the FoMES and rectorate, was not considered. Further research is needed to examine other success factors, e.g., if top management support is as important at HEIs as in ERP projects.In the case of several german universities, a reformation is in progress, granting universities more autonomy[16]. This leads to a change of universities' structure, reducing autonomy and power of faculties.

6 Conclusion

Integrated enterprise systems are becoming more important for HEIs for several reasons. As communication is an important factor in implementation projects at HEIs, we examined aspects having negative impact on the information flow in a case study. We found that the vague definition of roles, improper decision makers, informal communication, the transfer of inherent experiences and knowledge, and the lack of documentation had a negative impact on the information flow. Especially the first three aspects have reasons lying in the specific organizational structure of the HEIs. To reduce negative impacts on the information flow, it is necessary to provide clear definitions of the structure and roles in the project. It is important that the purpose, tasks, rights, duties and, where necessary, members of the role are defined. Further, it is necessary, especially for an external project team, to involve university members into the project. We see two main challenges at HEIs. First, to understand the specific,

decentralized organizational structure. Second, to assign tasks and roles to adequate employees that are professionals or that are supported by professionals.

7 Literature

[1] Alt, R; Auth, G (2010): Campus Management System. Business & Information Systems Engineering 2(3):187-190.

[2] Benelux Bologna Secretariat (2007): About the Bologna Process. http://www.ond.vlaanderen.be/hogeronderwijs/bologna/about/.Abgerufen am 09.09.2011.

[3] Birnbaum, R (1989): How colleges work. Jossey-Bass, San Francisco.

[4] Bode, A; Borgeest, R; Pongratz, H (2007): The ICT Strategy of the Technische Universität München. In: JF Desnos and Epelboin Y. (Hrsg.), *Proceedings of 13th International Conference on European University Information Systems*. Grenoble.

[5] Brune, H; Jablonski, M; Möhle, V; Spitta, T; Teßmer, M (2009): Ein Campus-Management-System als evolutionäre Entwicklung - Ein Erfahrungsbericht. In: HR Hansen; D Karagiannis; H Fill (Hrsg.), *Konzepte, Technologien, Anwendungen, 9. Internationale Tagung Wirtschafts-informatik (WI 2009).*Wien.

[6] Davenport, TH (1998): Putting the Enterprise into the Enterprise System. Harvard Business Review 76(4):121-131.

[7] Duke, C (2002): Managing the Learning University. Open University Press, Buckingham.

[8] Eisenhardt, KM (1989): Building Theories from Case Study Research. The Academy of Management Review 14(4): 532-550.

[9] Fischer, H; Hartau C. (2009): STiNE an der Universität Hamburg - Zur Einführung eines integrierten Campus-Management-Systems. In: HR Hansen; D Karagiannis; H Fill (Hrsg.), *Konzepte, Technologien, Anwendungen, 9. Internationale Tagung Wirtschaftsinformatik (WI 2009).*Wien.

[10] Flick, U; Kardorff, E v.; Steinke, I (2009): An Introduction to Qualitative Research. 4. Auflage. Sage Publications. London.

[11] Heiskanen, A; Newman, M; Similä, J (2000): The social dynamics of software development. In Accounting, Management and Information Technologies 10(1):1-32.

[12] Hoermann, S; Kienegger, H; Langermeier, M; Mayer, M; Krcmar, H (2010): Comparing Risk and Success Factors in ERP Projects: A Literature Review, *Proceedings of the Americas Conference on Information Systems*. Lima, Peru.

[13] Hubig, L (2009): Die Universität. 1. Auflage. Eul, Lohmar.

[14] Janneck, M (2010): Challenges of software recontextualization: lessons learned, *Proceedings of the 28th of the international conference extended abstracts on Human factors in computing systems*. Atlanta.

[15] Klug, H (2009): Erfolgsfaktoren bei der Umstellung von Informationssystemen an Hochschulen. In: HR Hansen; D Karagiannis; H Fill (Hrsg.), *Konzepte, Technologien, Anwendungen, 9. Internationale Tagung Wirtschaftsinformatik (WI 2009).* Wien.

[16] Land Nordrhein-Westfalen (2006): Gesetz über die Hochschulen des Landes Nordrhein-Westfalen (Hochschulgesetz – HG). http://www.wissenschaft.nrw.de/objekt-pool/download_dateien/hochschulen_und_forschung/HFG_22_10.pdf. Abgerufen am 09.09.2011.

[17] Lupu, A; Bologa, R; Sabau, G; Muntean, M (2008): Integrated information systems in higher education. WSEAS Transactions on Computers(7):473-482.

[18] Maxwell, JA (2005): Qualitative Research Design: An Interactive Approach. SAGE, Los Angeles, CA, USA.

[19] Mayring, P (2010): Qualitative Inhaltsanalyse. 11. Auflage. Beltz, Weinheim.

[20] Minssen, H; Wilkesmann, U (2003): Lassen Hochschulen sich steuern? Soziale Welt 54(2):1-29.

[21] Mintzberg, H (1980): Structure in 5's: A Synthesis of the Research on Organization Design. Management Science 26(3):322-341.

[22] Radenbach, W (2009): Integriertes Campus-Management durch Verknüpfung spezialisierter Standardsoftware. In: HR Hansen; D Karagiannis; H Fill (Hrsg.), *Konzepte, Technologien, Anwendungen, 9. InternationaleTagungWirtschaftsinformatik (WI 2009).*Wien.

[23] Robbins, S; Barnwell, N (1998): Organisation Theory: Concepts and Cases. Prentice-Hall, Englewood Cliffs, New Jersey.

[24] Saaty, TL (2008): Decision making with the analytic hierarchy process. In International Journal of Services Sciences(1):83-98.

[25] Schilbach, H; Schönbrunn, K; Strahringer, S (2009): Off-the-Shelf Applications in Higher Education: A Survey on Systems Deployed in Germany. In: W Aalst; J Mylopoulos; NM Sadeh; MJ Shaw; C Szyperski; W Abramowicz; D Flejter (Hrsg.),*Business Information Systems Workshops: Lecture Notes in Business Information Processing*.

[26] Sonntag, K; Stegmaier, R; Michel, A (2008): Change Management an Hochschulen: Konzepte, Tools und Erfahrungen bei der Umsetzung. In: R Fisch; A Müller; D Beck (Hrsg.), *Veränderungen in Organisationen.* VS Verlag für Sozialwissenschaften.

[27] Sprenger, J; Klages, M; Breitner, MH (2010): Cost-Benefit Analysis for the Selection, Migration, and Operation of a Campus Management System. Business & Information Systems Engineering 2(4):219-231.

[28] Statistisches Bundesamt (2010): Studierende an Hochschulen. Vorbericht Wintersemester 2009/2010. http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Content/Publikationen/Fachveroeffentlichungen/BildungForschungKultur/Hochschulen/StudierendeHochschulenVorb2110410118004,property=file.pdf. Abgerufen am 09.09.2011.

[29] Tapscott, D (1996): The Digital Economy: Promise and Peril in the Age of Networked Intelligence. McGraw-Hill, New York.

[30] Walsham, G (2006): Doing interpretive research. European Journal of Information Systems 15(3):320-330.

[31] Yin, RK (2009): Case study research. 4. Auflage. SAGE, Los Angeles, California.

[32] Zgaga, P (2007): Looking out: The Bologna Process in a global setting. http://www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/WGR2007/Bologna_Process_in_global_setting_finalreport.pdf. Abgerufen am 09.09.2011.